

APOLLO

Further on Differentiation

FBISE Mathematics Class 12 (HSSC-II)

Domain A: Numbers and Algebra

20 questions | questions

Original FBISE question crops. National Curriculum 2022-23 topic.

iv.	If $y = x^3 \ln(\sqrt{x^2+1})$, then find $\frac{dy}{dx}$.	4
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vi.	Find the derivative of the function w.r.t.x: $f(x) = \sin^{-1}\left(\frac{x}{2}\right) + \tan^{-1}\left(\frac{\sqrt{4-x^2}}{x}\right)$.	4
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(iv)	Differentiate $y = \sin^{-1}\left(\frac{2x}{1+x^2}\right)$ w. r. t. x.	04
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	Find $\frac{dy}{dx}$ for $y = e^{2x} \ln(x)$	04
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(iii)	Evaluate $\int \sin^2 x \, dx$	04	OR	Determine the intervals in which $f(x) = x^3 - 3x^2 - 9x + 5$ is increasing or decreasing.	04
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(ii)	Find $\frac{dy}{dx}$ if $y = e^{3x} \ln\left(\frac{2x}{x^2+1}\right)$
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	Determine the intervals in which the function $f(x) = x^3 - 6x^2 + 9x - 4$ is increasing or decreasing.	04
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(iii)	If $\tan y(1 + \tan x) = 1 - \tan x$, then show that $\frac{dy}{dx} = -1$.	04
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	Differentiate $\ln(x^2 + 2x)$ w.r.t x, using Chain Rule.	04
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Find $\frac{dy}{dx}$ if $y = \ln(x + \sqrt{x^2 + 1})$	08
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OR	Determine the intervals in which y given by $f(x) = 4 - x^2$; $x \in (-2, 2)$ is increasing or decreasing for the given domain.	04
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(ii)	Find $\frac{dy}{dx}$ if $y = (x+1)^x$	04
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If $y = \sin(3x^2)$, then $\frac{dy}{dx}$ is:	$\cos(3x^2)$	$6x\cos(3x^2)$	$\cos(6x)$	$3x^2\cos(3x^2)$	☐	☐	☐	☐
	1		1		☐	☐	☐	☐

answer.	
Determine whether $f(x) = -4x^3 + 6x^2 + 2$ is increasing or decreasing at $x = 1$.	04

iv.	What is the derivative of $\log_5 e^x$ w.r.t. x ?	$\frac{1}{x \log 5}$	$\frac{1}{x \ln 5}$	$x \log_5 e$	$x \ln e$
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v.	What is the value of $\sqrt{1-x^2} \frac{dy}{dx} (\sin^{-1} x + \cos^{-1} x)$?	2	0	$\sqrt{1-x^2}$	$\frac{1}{x}$
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OR	Determine the equation of the tangent to the curve defined by $y = 2x^2 - 7x + 1$ at $x = 2$.	4
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OR	Find the derivative of $\sin^{-1} \left(\frac{2x}{1+x^2} \right)$ w.r.t. $\tan^{-1} x$.	4
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Find all the points on curve $y = 2x^3 + 4x^2$ where tangent line is parallel to the line $y =$ $8x - 4$.	4
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Q3	A curve has an equation $y = \frac{1}{2}x^3 - 9x^{1.5} + \frac{8}{x} + 30, \quad x > 0$ (a) Find $\frac{dy}{dx}$ (b) Show that a point $(4, -8)$ lies on the curve defined. (c) Find equations of the tangent and normal at $(4, -8)$ giving your answer in the form $ax + by + c = 0 \quad \forall a, b, c \in R$	8
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